

The Conceptions of Freire and Papert Inside the City of São Paulo’s Curriculum and the Re-Signification of Constructionism in Pedagogical Practices

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Abstract

This article analyses how Rede Municipal de Ensino de São Paulo (“São Paulo’s Municipal Education Network”) incorporated and re-signified Papert’s constructionist theory and Freire’s humanizing pedagogy in its Technologies for Learning curricular proposal. Following a bibliographical and documental approach, it is identified that there is an enhancement in learning by the production of artifacts by students. The analysis also highlights teacher training as essential for the adoption of these concepts. The results point to the presence of constructive elements in the pedagogical practices in the network, showing the transformation of the curriculum’s theories into action and reorganizing the Digital Education laboratories following contemporary demands.

Keywords and Phrases: Constructionism, Learning, Protagonism, Engagement, Humanizing Pedagogy.

1. Introduction

The conversation between Paulo Freire and Seymour Papert in “The Future of Schools” (1995) reveal perspectives of the Gênese project within Rede Municipal de Ensino de São Paulo, which proposed the pedagogical use of digital technologies. Created during Freire’s mandate as the city of São Paulo’s Secretary of Education.

The proposal intended to reorient the curriculum, giving priority to “learning with computers”, through the use of the programming language Logo, with a constructionist approach; including questions about the reasoning of its utilization, as well as about social, cultural and philosophical aspects of education, which the objective of transforming schools in a high quality space, accessible to everyone (SÃO PAULO, 1992).

Freire affirmed that he had no doubts about the potential of computers in enhancing and providing learning, but they were in the hands of a small percentage of the population. Having this in mind, the introduction of communication technologies in the teaching and learning processes aimed to change schools, transforming them into “a rich school for a poor population”.

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The Decree nº 34.160, from May 9th, 1994, established the creation of Laboratórios de Informática Educativa (LIE, “Educational Computing Laboratories”) in all Rede Municipal de Ensino (RME, “Municipal Teaching Network”). This decree also created Professores Orientadores de Informática Educativa (POIE, “Educational Computing Orienting Teachers”), designed to organized the activities done inside the LIEs.

Currently, there are 565 elementary schools with these laboratories, but with another name: Laboratórios de Educação Digital (LED, “Digital Education Laboratories”), and approximately 900 Professores Orientadores de Educação Digital (POED, “Digital Education Teachers”), the current denomination of POIEs, act in these spaces, with, at minimum, 01 weekly class to all students.

The POEDs are responsible for maintaining the conceptions of the Gênese project, promoting the use of technology in teaching. Despite technology advancements and new training methodologies, teachers continue to search for basis to help them organize their classes. The teacher training and the institutional documents were created to meet this demand

In 2017, a new curricular proposal for elementary school in Rede Municipal de Ensino de São Paulo (RMESP) was made. It is organized in 3 learning cycles: literacy, interdisciplinary and authorship. The cycles are seen as continuous process in training, and obey movements, advancements and push-backs in learning (SÃO PAULO, 2017).

The recommended action emphasises the dialogue between the curriculum and current social dilemmas, with the intention of giving to the new generations active participation in the transformation of local reality and in the fight against global challenges (SÃO PAULO, 2017), following the Sustainable Development Goals (SDGs) in consonance with the constructionist ideas, strengthen the possibilities of a contextualized education.

For Almeida (2024), one of RMESP’s differentials is its elementary school’s curricular structure based in three cycles, in which the third is called.

Therefore, this article has the intention of comprehending how the constructionist theory was implemented in RMESP and how it was re-signified in educational practices. To identify the presence of elements of Papert’s constructionism and Freire’s humanizing pedagogy, two strands of analysis were made: bibliographic and documentary.

The analyzed documents are institutional documents, as well as registers made by teachers of the student’s work in Seminário e Motra de Tecnologias, an event organized by RMESP: Currículo da Cidade Ensino Fundamental Tecnologias para Aprendizagem (SÃO PAULO, 2017), Currículo da Cidade Educação de Jovens e Adultos (SÃO PAULO, 2018), Orientações curriculares: proposições de expectativas de aprendizagem – Ensino Fundamental I (SÃO PAULO, 2018) e Tecnologias para Aprendizagem: da Informática Educativa à Educação Digital: trajetórias que fazem história. (SÃO PAULO, 2024), Cultura Maker como proposta curricular de tecnologias na política educacional da cidade de São Paulo. (GAVASSA, 2020) as well as banners and websites made by students and POEDs.

The observation and analysis of these registries intend to identify the development of the constructionist approach in the processes and products in the different editions of Ação Promovendo Reflexão.

2. Constructionism and Humanizing Pedagogy

Seymour Papert, one of the fundamental authors in usage of computers in learning, recognized that computers could be used not only to provide instructions and information, but also as an artifact that favours communication and expression of thoughts.

For Valente (2005), constructionism is an approach in which the student builds, using a computer, their own knowledge. Papert used this term to show the knowledge building that happens when a student experiences the building process of a product that they showed interest in, something tangible, such as a pie, a robotic prototype or a computer program. “First, the student builds something, that is, the knowledge through making, ‘hands on’. Second, the fact that the student is building something of their interest, and which they are very motivated. The affective involvement makes the learning process more significant.” (VALENTE, 2005 p.2).

In the constructionist perception of learning by making, children will perform better discovering things by themselves. There are, however, personal and relevant strategies to organize this work, “some people prefer ways of thinking that keep them close to physical things, while others use abstract and formal means to distance themselves from concrete material.” (PAPERT, HAREL, 1991). Autonomy is something intrinsic to constructionism.

In many articles that approach constructionism, it is pointed out that the simple execution of a task is not enough to build knowledge. It is necessary to do and comprehend the task through contemplation, the organization of mathematically rich activities mediated by a teacher, dialogue and by the sharing of knowledge and the collaboration between students.

The use of technological resources in education must involve didactic and pedagogical aspects. In this perspective, project based learning is considered an educational proposal that favours the development, autonomy, experimentation and authorship of students. This process makes the coexistence of different world views and the contextualization of concepts and strategies feasible, which stimulates the students’ interest and participation in the learning process (ALMEIDA, 2024; VALENTE, BLIKSTEIN, 2019; PAPERT 2008; FINO, 2020; ALMEIDA E VALENTE, 2011; DEWEY, 2011).

Paulo Freire’s proposal, who is considered Brazil’s Patron of Education, invokes a humanizing pedagogy that contributes to the development of a just, humane and egalitarian society that consider an individual’s formation and history inseparable. This provides them with the possibility of overcoming the position of mere spectators of history to become active participants in it, in a free and critical way. This is possible through dialogue and a horizontal relation between students and teachers. For Freire, both students and teachers transform themselves in the pedagogical action, learning and teaching simultaneously.

Besides the obligatory contents related to the program's organization, the educator cannot refrain from using a pedagogy based in ethics, respect and the student's autonomy, and also from helping them reach a better way of thinking. Therefore, the inter-relation between theory and practice requires the association between action and reflection, as per Freire's theories.

For Freire, freeing education is a humanizing factor (FREIRE, 2004) where it is "profiled in interactions with the world and in learning a process that can stimulate in the student a growing curiosity, which can turn more and more creative" (FREIRE, 2002, p.14).

Something strong and present in humanizing pedagogy is looking into the established relationships between teachers and students. These relationships must be based in respectful interactions between individuals, so that a critical knowledge in search of autonomy can be built. "Nobody is subject to nobody's autonomy" (FREIRE, 2004, p. 67), because its developments is the result of an individual effort built based on the relationships between human beings, and, only in these interactions, can it be consolidated and shared.

These conceptions formed the basis of the curricular document of technologies, supported in the observation of the practices of the teachers responsible for the LEDs.

3. The Writing Process of the Curricular Dokument and the Challenge of Making it Reach Everyone

The creation of a specific curriculum for digital technologies in basic public education was a brand new process in Brazil. It was marked by research and contemplation, given that no national references existed prior to it. RMESP based this document in constructionist conceptions, in humanizing pedagogy and in avoiding ideological and political discourse in the use of technology. The teachers pointed to a necessity of a document which could guide their practices without compromising their autonomy.

We made researches, read documents and institutional conceptions, analyzed registers of pedagogical processes and practices, and payed attention on how the network's teachers had already been using technologies in teaching and learning.

A Working Group was created, which enabled the sharing of concrete experiences done in different schools, and also collaborated in the decision making of the path to be followed on the writing of the curriculum. "The importance of understanding the past as a manager of new eras, impel us to the metamorphosis of a freer, unique and happier knowledge" (FAZENDA, 2008), valuing learning through educational experience and

When sharing experiences, we observed the frequency in which practices structured by learning appeared: through challenges and projects based on problem investigation and solving, stimulating reflection, inventivity, protagonism and collaborative processes. That is, using "making", the "experience" and reflection as possibilities to construct knowledge.

Maria Elisabeth Bianconcini de Almeida, co-author of this article, and José Armando Valente worked as consultants on the writing of the curricular document and helped on transforming the reported experiences into development and learning objectives.

Valente affirms that cognitive, intra and interpersonal attributes must be within the expected abilities in the 21st Century (VALENTE, 2018), as well as the abilities identified within the shared actions between the work group. He also adds that students will learn with hands on activities and through the development of projects in different subjects. “This is the ability expected from professionals who work with digital culture” (VALENTE, 2018, p. 24).

The group organized the student’s learning rights using technologies (table 1) as a starting point for the writing of the curricular document’s objectives:

Learning Rights
1. To learn technologies with equity, using different medias/vehicles.
2. To explore and test different technologies.
3. To learn and use technologies to contemplate and search for solutions to challenges, with liberty of choice, having their personal learning strategies respected.
4. To use technology as an interaction vehicle to research, choose, share, create, interact and to take ethical decisions
5. To exercise dialogue, argue, analyze different points of view and respect common decisions, aiming to understand the world and its transformation.

Table 1: Learning Rights with technologies (São Paulo, 2017).

After setting the learning rights with technologies, described in Picture 1, the Working Group set the path to be followed for the writing of a referential document of pedagogical practices with the use of technology. This group also stipulated the principles for the usage of technologies for learning, strengthening the adopted conceptions: Autonomy, inventivity, collaboration, contemplative thinking, information and building of knowledge, digital culture and the protagonism of teachers and students.

The concept of Computational Thinking was used as one of the document bases. It describes a way to develop the analytical and expressive capacity of children and teenagers, articulating itself through the challenges of our current society, stimulating the active participation of the students and the 5 “P”s of Sustainability (People, Plant, Prosperity, Peace and Partnership). Also considered were the 3 Cycles of Learning, with a focus in enhancing the time and quality of learning, respecting the intellectual, sociocultural and affective development of the students.

A pioneer and innovative curriculum that values the teacher’s autonomy represents the challenge of making it well known and incorporated by the teachers of RMESP. For this, the 900 POED participated in an intensive training, spanning 5 days. This training was composed of theoretical lectures and practical activities, aiming the better comprehension of the proposed objectives and methodologies. It also aimed that each POED started these practices in their schools and student groups, as shown in Figure 1.

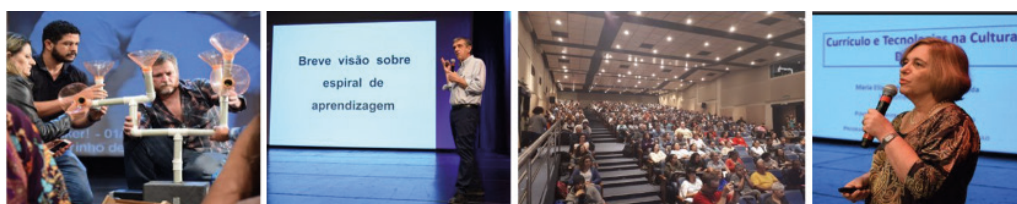


Figure 1: Training activities for the implementation of the new city curriculum (Currículo da Cidade – Tecnologias para Aprendizagem)

In the light of constructionism and humanizing pedagogy, “Ação Promovendo a Reflexão”¹ was another fundamental strategy to tackle this challenge. It is constituted as a participative training activity, motivating reflexive thinking, valuation of authority, collaborative production and sharing. It allowed concrete reflexive actions in pedagogical practices and enhanced discussions about the role of technologies in the plain development of human beings in different social ambients.

In the analysis of these registers and in the effective participation of this article’s authors in this event, it is evident that during its organization, many activities are offered: a virtual presentation of the projects, an in-person presentation from the students showing their projects, workshops for teachers, a Robotics JAM² and speeches.

After a successful execution and the perception of transformations in practices, Ação Promovendo a Reflexão became an annual event, and it is already on its 11th edition. As time went by, new activities were added, such as Game JAM, a programming Hackathon, presentation of Trabalho Colaborativo de Autoria (TCA, “Collaborative Work of Authorship”), as well as journalistic covers and registers made by students of the programs “Imprensa Jovem” and “Aluno Monitor”.

The curricular document and the Seminário e Ação Promovendo Reflexão event can be considered as guides to what is practiced in the LEDs.

4. Evidences of Papert’s and Freire’s Conceptions in the Writing and Creation of the Curricular Proposal

The challenge of building a curricular proposal without an explicit reference brought the necessity of learning what was already being made by educators of RMESP using technology more in depth. Therefore, the writing of the curricular document had the help of educators, the aforementioned Working Group, as well as the inquiry made with students, which highlighted their wish to be more involved in the learning processes.

Within the graphics found in the first part of the curricular document, it is shown that, from the 43.655 students who answered the inquiry, 40,2% answered that they liked projects involving communication, newspapers, photography or videos; 48,7%

1 Ação Promovendo a Reflexão – strategies of engagement in active processes of learning, adopted by the Tecnologias para Aprendizagem team, responsible for the training of POIEs in RMESP.

2 Robotics JAM – characterized as a one day marathon, where groups of 5 students and 1 teacher worked together in the building of creative prototypes that helped them to learn the basic principles of the robotics kit and the programming language used, following a proposed challenge.

answered that they would like to participate in cultural activities; 46,6% liked activities involving computing and robotics; 48,8% answered that being creative is a necessity; and 63,5% answered that it is necessary to be organized in school.

About knowledge, 57,5% of the students answered that it is easier to learn with the help of technology, music, games and other similar resources. And 55,4% answered that they learned better when there is a space for discussion; 65,2% answered that using the internet in school activities is an important factor to learn better; 58,5% said that going to computing labs helped in the learning process; and 59% of students thought that group activities stimulated learning.

The concept of Computational Thinking, utilized by Papert in his book *Mindstorms* (Papert, 1980, p. 182) was chosen as background for the writing of the document. Its objective is to create conditions so students can learn about how things work, so they can choose when to best use them; to restructure a seemingly difficult problem into something that can be tackled in parts; to use computing fundamentals as a critical, creative and strategic way to solve problems; and to structure solutions beyond the use of technologies, validating interdisciplinary knowledge.

The document was subdivided into three integrated axes:

Programming: aimed at the descriptions of ideas; reflection; working with trial and errors; dialectic movement between concrete and abstract thoughts; identification of different gadgets and the logic behind its machinations; capacity of analysis; structuring of logical sequences of action; organization and narration of facts, emotions and experiences in different media.

TIC – Tecnologias da Informação e Comunicação (“Information and Communication Technologies”): a tool of participation in society; planning, elaboration and sharing of productions; access, security and proofreading of information sources; knowledge of legal aspects that protect intellectual authorship; moral and ethical implications of communication through virtual spaces; mutual respect to others and their productions.

Digital Literacy: related to the use of different media languages, with a reflexive approach; comprehension about the uses and impacts of technology in people’s lives; identification of the potential of technology in meeting people’s needs; approximation and use of technology in social situations; development of critic, creative and civilized conscience with the use of TICs; understanding of the potential of technologies in scientific thinking.

These axes (TIC, Digital Literacy and Programming), incorporate the digital world into Freire’s ideas, of students as conscientious individuals who are part of history and can transform realities. The integration of the 3 axes enhances the constructionist pedagogical practice.

The curricular document was written with the intention of predicting and improving the use of technologies in all areas of knowledge. It defined digital education as a Curricular Component, with the objective that all elementary school students are able to: recognize how to better use the increasingly more available information; act

with discernment and respect in contexts of digital culture; use their knowledge to solve problems; be proactive; analyze data and search for solutions through experimentation and prototyping.

In the year following the acceptance of the curricular document, orientations were elaborated to support the implementation of the proposed methodologies in teachers' practices. The suggested methodologies include project based learning, investigation, game based learning, gamification and learning through making and tinkering, as well as the implementation of robotics as an object of study and pedagogical strategy. The proposal aim to transform the labs into places for experimentation, dialogue and knowledge constructions based on tangible productions.

From the “hands on” approach to questions about digital citizenship, the curriculum emphasizes a pedagogy focused on social transformations, scientific literacy and the inter-relation between multiple cultures, technologies, languages, media and methodologies (ALMEIDA, 2022).

5. Evidences in Training and Pedagogical Actions

5.1 *Seminário e Mostra de Tecnologias: Ação Promovendo Reflexão*

Ação Promovendo Reflexão is an annual event where students and teachers can show what they developed in school. During the registration process of the event, participants must send not only the finished product, but also a register of the development process of their project. These registers are sent digitally during the registration process, but banners and websites are also created for the showing. These documents were used on the previously mentioned analysis of pedagogical practices. With their projects being accepted, students and teachers can present their productions during the event, as shown in Figure 2.

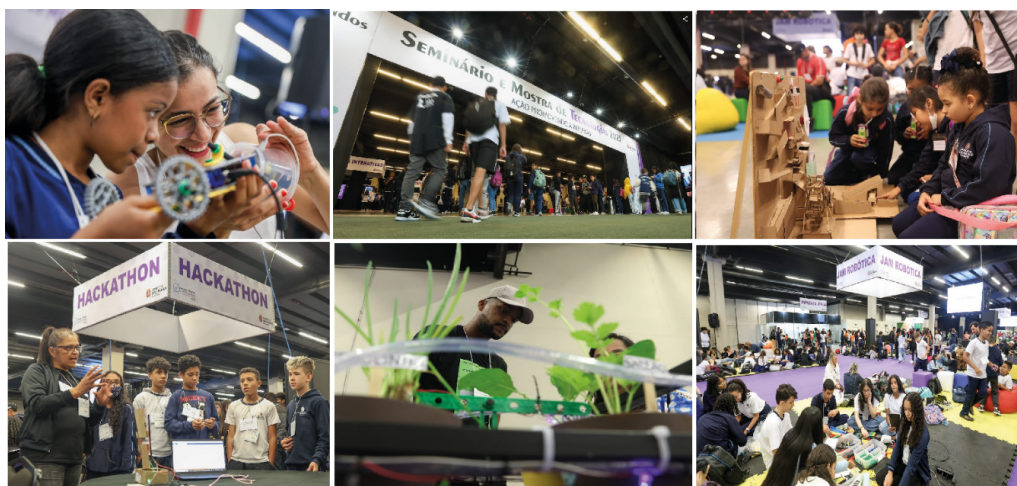


Figure 2: Images from Ação Promovendo a Reflexão.

The activities are organized in a digital space and can be chosen by the participants in the moment of registration. They are:

JAM and Hackathon – robotics and programming marathons, respectively, created so students can put their knowledge in technology in practice, in search of tangible solutions for the proposed challenge. It also induces the students into looking into the local reality, actively rethinking human and social developments. An intense and

creative movement stimulates work in mixed groups of boys and girls from different backgrounds, ages and territories. Together, these students investigate, discuss and build robotic prototypes that can solve the proposed challenge, in an innovative and bold way.

In the many JAM editions, the groups organized themselves and helped others to turn the prototype into something real, following the theme proposed by the mediator in the beginning of each edition. During the development of the prototype, students share processes and results in the arena itself and finish the activity having had the opportunity of learning and reflecting with their teammates, teachers and the other groups.

Whereas during the Hackathon, promoted to high school students and students from the last years of elementary school, the groups tackle the problematic given by the organizers by programming. Groups have 2 days to go through the stages of idealization, planning, development and prototyping. At the end, the groups present their prototype and the process to build it to an audience. The intention is that, during the presentation process, the groups revisit their productions and reflect about the knowledge they acquired during the event. At the end of this activity, the technological resources used in it are gifted to the participating school's LED.

During the Ação Promovendo Reflexão event, students speak about the process and the products they made to a public of teachers, other students, administrators and students' families.

Teachers from RMESP and some guest specialists give the speeches.

The participation of teachers, students and administrators in RMESP's events allows people from different regions of the city to share experiences, inspiring new pedagogical practices. Unfortunately, however, given the sheer number of schools and professionals in RMESP, only 30% of them can participate each year, which limits the range of the initiative.

5.2 Analysis of processes and products originated by the students' projects

Two projects presented in 2024's Ação Promovendo Reflexão stood out during the students' presentation. We analyzed these projects, given the groups showed a great understanding of the process they followed until the solution presented in the event. The analysis aimed to identify evidences that the conceptions proposed by the curriculum were already implemented in pedagogical practices.

The first analyzed project was called "Arquiteturas pelo Mundo: Articulações entre Patrimônio Histórico e o Currículo de Tecnologias para Aprendizagem sob Perspectiva Decolonial" was developed in 2023, with 3 classes of (Brazil's) 6th grade students, during the classes in the LED. The project integrated topics of History, Geography and Art Studies into what was provided by the curriculum, using as methodology project based learning.

It was created because of the interest of the teacher and his students in topics regarding colonialism. As they searched about historical monuments around the world, the students noticed the lack of images representing African, Native American, Asian

and Middle Eastern history and culture. This was noticeable for the students because they studied with immigrants or refugees of these regions, since Brazil is a continental country.

The theme defined for the project was Humanity's Historic Heritage, with each class focusing in a different cultural branch. Students used 3D printers to produce their prototypes, exploring the many possibilities of this technology, with the pedagogical intention of constructing new knowledge in digital literacy and programming. The materialization of the prototypes also enabled the creation of tactile resources, favoring inclusive actions to students that suffer from visual deficiencies, but also helping all the others in the learning of Art and History.

The collection produced by the students was made available in the world's 3D printing database, filling an important gap identified at the beginning of the project. The prototypes were also exposed in the school so students of other classes could see them (Figure 3).



Figure 3: Students of other classes handling the products made by their colleagues.

The second project that was analyzed was “Visionary Scope”, developed by students from a robotics study group. The idea came to be after the teacher suggested the students to create something using the materials found in the LED, with a focus in accessibility. The students, then, defined a product: a pair of glasses with a sensor capable of detecting the position and distance of objects and of emitting a sound warning. For this, they elaborated a prototype with a sensor, a micro bit board and a motor. During the tests, done by walking through the school, they noticed that there were some obstacles not being detected by the glasses, especially the ones under the field of vision. Following this observation, they developed a complement for the project: a vest that followed the same concept of the glasses, as shown in Figure 4.



Figure 4: Testing and presenting the programming of the prototype.

The analysis, based on conceptual fundamentals, highlighted that both projects incorporated conceptions of constructionism and humanizing pedagogy. The students started from themes that caught their attention, and, building a tangible product, made discoveries, using personal strategies to organize their work, with the orientation of the teachers. They stopped being mere spectators of history to become active participants, since both projects help other people and promote transformations in reality.

It's clear that, in these registers, building the projects, students go through a process of make-reflect-redo until their goal is reached, living through a contextualize and re-constructive.

These, as well as other projects presented in 2024, when compared with the ones from the first years of Ação Promovendo Reflexão – thoroughly analyzed by one of the authors, orientated by the other, in a dissertation which resulted in the conclusion of her master's degree *“Cultura Maker como proposta curricular de tecnologias na política educacional da cidade de São Paulo”* – show an advancement in the objectivity and intentionality of the current proposals.

Even though there still is some resistance shown by some teachers in the adoption of constructionist learning in São Paulo's curriculum – many times influenced by poor training and the limitation on the reach of the events earlier described, that can only support a part of the 37.654 teachers in the network – it can be noticed an increase in POEDs, collaborating with colleagues from other areas or assuming the orientation of TCA projects.

During the development of TCAs, students are instigated to build a product based on the group's interest and problems present in their realities. During the creating of tangible products, students gain relevant knowledge to their own lives, develop digital, scientific and social literacy and become more conscious and independent citizens.

“The TCA is a proposal that aims to use practical and conceptual elements to promote scientific and digital literacy to students, so that, following collaborative research, they can be connected to aspects of social knowledge, so they can do an ethical and responsible research” (FARIAS, CAETANO NETO, 2024).

In the registers of the projects shown in Ação Promovendo Reflexão, we can notice the involvement of themes very close to the realities of the students, who search orientation and information from specialists and communities. This way, they reach the objective, proposed by themselves. An example is the project “Saúde Mental na adolescência: uma parceria entre a escola, a comunidade e rede de proteção.”

It is, therefore, a constructionist and humanizing pedagogical approach with an effective and protagonist participation from the students, since it foments the investigation, reading and problematization of the real world, in a way that involves different voices and visions, civic engagement and favors autonomy.

5.3 The work in the LED registered in de E-book

The analysis of the e-book “Tecnologias para Aprendizagem: da Informática Educativa à Educação Digital: trajetórias que fazem história” – which celebrates the 30 years of the use of technology in RMESP – brought evidences, through the report of teachers, of the relation between their training and practices. It highlighted, as well, how the organization of the LED in schools helped learning through practice and the construction of artifacts.

In page 30 of the e-book, we can find some reports from teachers:

“LED offers the opportunity to create strategies using a creative and bold didactic, so students can experience technological tools, seeing in them possibilities to create social products.” (SÃO PAULO, 2023 p.32)

“A teaching method that could be abstract, inside the LED, gains physical form and a meaning to the students.” It is both a psychological and pedagogical welcome. LED is a transversal space, a place for meetings. Our work only makes sense if it collective.” (SÃO PAULO, 2023, p. 57)

“In a Scratch training, a multimedia software, I started to be interested in different forms of working which stimulate, on the student, invention and creativity. That's how computer screens stopped being the center of attention in classes”, (SÃO PAULO, 2023, p. 59)

“The trainings offered by SME are essential for the day by day inside the LED. It allows us to *‘create different routines to build new pedagogical strategies’*. One of the changes informed by the teacher were that at the end of classes students presented to the others their progress with the projects. *“One see what the other did, and all applaud.” “The class becomes focused and happy, because it's when the work they did become known shared and valued”*. (SÃO PAULO, 2023 P.60); in other reports,

teachers evaluates positively the trainings: “*The trainings are constant and of quality.*”; “The monthly training is important to create and put in practice projects that innovate and impact the lives of many people.”; “*In the LED, the knowledge is never stagnated. Besides the trainings, we exchange a lot with students. I learn with them and they learn with me.*” (SÃO PAULO, 2023, p. 62).

These reports show that the LED is a free space for creating and experimenting. They also highlight the importance of a qualified training, focused in helping the pedagogical work. It is a fundamental element for the transformation of teaching practices. Inside the LED, students have the opportunity to take concrete actions and to learn through discovery, constructing the necessary knowledge to reach the results they aim with their products, through trial, errors and successes.

6. Conclusions

This article proposed to identify indicative elements of constructionism in pedagogical practices that incorporate technologies developed in RMESP, articulating with humanizing pedagogy. For this analysis, we analyzed institutional documents and registers, as well as reports of practices made by teachers of the network.

We could observe a re-signification of Papert and Freire’s theories in the educational practices, which aim to promote knowledge through the students’ learning demands, orientated by a curriculum that understands technology as a mediator for knowledge and as a contemporary object of study.

This presence was also identified in teachers’ reports, registered in e-book, institutional videos, and websites produced for the Ação Promovendo Reflexão event, which integrated the analyzed material. The pedagogical proposals developed in the LEDs highlight this movement, as LEDs are recognized as spaces of methodological liberty that favors the investigation, critical reading and the recognition of problems of the real world.

The investment in continuous training and the value of pedagogical practices have been contributing significantly to the incorporation of these approaches, as shown in the analyses of the projects from Ação Promovendo Reflexão during the years.

Liberty is essential, as long as accompanied by the necessity of pedagogical methods and strategies, as well as a creative and bold didactic and the flexibility of teachers to follow and help students, based on their interests and necessities and the projects they idealize.

The LED is seen as a humanizing place of experimentation, creation and elaboration of hypothesis and materialization of learning. As it is based on its own curriculum and acts as a specific curricular component, its work does not limit to learn the machine, but **with** the machine.

We could observe the autonomy of teachers and students in search of their own ways to reach results, which shows the re-signification of concepts and methodologies.

The adopted methodologies structure the teachers’ training and enhances creation and innovation, with the purpose of social transformation, active insertion of students in the educational process and promotion of autonomy and emancipation.

These characteristics and conceptions support the trainings' frame and are the base of events like Ação Promovendo a Reflexão, which value practice and construction as ways of learning.

In conclusion, the analyses show clear evidences of the presence of elements of Papert's constructionism and Freire's humanizing pedagogy since the beginning of the implementation of Educational Computing in RMESP.

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